JHARKHAND Rai University
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Lesson Plan & Tracking

Programe : B.TECH V	**Session : 2022-23**	**Year : 2022**	**Sem: V**
Course: SURFACE MINING			
Name of the Faculty: PURUSHOTTAM KUMAR	**Commencement Date:29th Aug 2022**		**Date of Closure:**

Lecture No.	Week	Unit	Topics to be Covered	Blended Mode			Date	Duration	Tracking of Lectures	Related Course Outcome	Signature of Faculty	Signature of HoD	Remarks (if any)
				ICT Tool/Platform/ LMS	Resources	Activity							
1	1	Unit 1	Introduction: Surface mining-basic concepts, applicability, advantages and disadvantages										
2		Unit 1	Role of surface mining in total mineral production; Deposits amenable to surface mining vis-à-vis excavation characteristics;										
3		Unit 1	Surface mining unit operations; Surface mining systems vis-à-vis equipment systems– classification,										
4	2	Unit 1	applicability, advantages and disadvantages. Opening up of deposits: Boxcut										
5		Unit 1	Types, parameters, methods; Factors affecting selection of box cut site										
6		Unit 1	Production benches– formation, parameters and factors affecting their selection. Preparation for excavation: Ripper:										
7	3	Unit 1	Types, classification, applicability and limitations; Method and cycle of operation; Estimation of output										
8		Unit 1	Concept of rippability. Estimation of number of drills required for a given mine production.										
9		Unit 2	Discontinuous/cyclic methods of excavation and transport										

10	**4**	**Unit 2**	Shovel-dumper operation: Applicability and limitations of electric shovel, hydraulic excavators and dumpers;										
11		**Unit 2**	Cycle time and productivity calculation for shovel and dumper; Estimation for equipment (shovel, dumper and other heavy earth moving machines)										
12		**Unit 2**	Method of work for sub-surface bedded and massive deposits and for hilly massive deposits by shovel–dumper combination.										
13	**5**	**Unit 2**	Drag line operation: Applicability and limitations, different modes of operation; Side cast diagram and calculation of reach										
14		**Unit 2**	Cycle time and productivity calculation; Calculation of required bucket capacity for a given handling requirement; Maximum usefulness factor and its significance in selection of dragline for a given situation										
15		**Unit 2**	Method of work by simple side casting.Scrapers: Applicability and limitations, various types; Method and cycle of operation; Pusher dozer and push-pull operation										
16	**6**	**Unit 2**	Dozers: Applicability and limitations; Types and classification; Types of blade and corresponding merits and demerits										
17		**Unit 2**	Method and cycle of operation.Front-end- loaders: Applicability and limitations; Method and cycle of operation;										
18		**Unit 2**	Minimum tipping-load– concept, estimation and significance										
19	**7**	**Unit 2**	Calculation of maximum working load										
20		**Unit 2**	Selection of bucket capacity of a front-end-loader for a given job condition.										
21		**Unit 3**	Continuous methods of excavation and transport: Bucket wheel excavators										
22		**Unit 3**	Applicability and limitations ; Types and principle of operation										

23	**8**	**Unit 3**	Operational methods–lateral block/half block method, full block methods										
24		**Unit 3**	Corresponding merits and demerits; Calculation of productivity										
25	**9**	**Unit 3**	Continuous surface miners: Types, classification, applicability and limitations; Principles of operation										
26		**Unit 3**	Operational methods–classification; Wide/full bench method, block mining method and stepped cut method										
27		**Unit 3**	Empty travel back method, turn back method and continuous mining method										
28	**10**	**Unit 3**	Conveyor/truck loading method, side casting method and windrowing method,										
29		**Unit 3**	Respective merits & demerits and applicability &limitations of these methods. Conveyors: Shiftable and high angle conveyors										
30		**Unit 3**	Mode of operation, applicability and limitations; Merits and demerits of conveyor as a system of transportation										
31	**11**	**Unit 4**	**S**emi-continuous methods of excavation and transport: Continuous excavation and partly/fully cyclic transport system										
32		**Unit 4**	Different methods and applicability limitations. Cyclic excavation and partly/fully continuous transport system										
33		**Unit 4**	Different in-pit crushing and conveying methods and their respective applicability & limitations										
34	**12**	**Unit 4**	Mining of developed coal seams and dimensional stones: Mining of developed coal seams										
35		**Unit 4**	Problems associated; Methods of working. Dimensional stones: Types										
36		**Unit 4**	Methods vis-à-vis equipment for extraction of primary blocks in granite and marble quarries. Slopes in surface mines										
37		**Unit 4**	Types of mine slope–high wall and waste dumps; Common modes of slope failure;										

38	**13**	**Unit 4**	Factors influencing stability of slopes; Slope stability assessment techniques;										
39		**Unit 4**	Waste dumps-types and formation methods										
40	**14**	**Unit 4**	Slope protection, stabilization and monitoring.										
41			Doubt Discussion										